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U. S. DEPT. OF AGRICULTURE    Animal Disease Eradication Division Specification  
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Technical Services

CURRENT SERIAL RECORDS    PROPRIETARY LIME AND SULFUR DIP SOLUTIONS PERMITTED  
IN ANIMAL DISEASE ERADICATION DIVISION PROGRAMS

1. SCOPE

1.1 This specification covers proprietary lime-sulfur dip solutions permitted<sup>1</sup> in the official treatment of specific livestock diseases as authorized by the Code of Federal Regulations administered by the Animal Disease Eradication Division.

1.2 This is a general specification designed to cover all concentrated lime-sulfur dip formulations to be permitted by the Animal Disease Eradication Division.

1.3 The specification covers lime-sulfur dip concentrates of formulation as specified in 2. The dipping bath for lime-sulfur dips must be used at a temperature of 95° to 105°F and must be maintained at all times at a strength as specified in 2.2.

2. REQUIREMENTS

2.1 Composition - The lime and sulfur solution shall be so formulated that it will contain not less than 28.0% by weight calcium polysulfide and obtain a specific gravity in the range from 1.270 (30.83° Baume) to 1.290 (32.60° Baume) at 60°F.

2.2 The Code of Federal Regulations, Title 9, Parts 73.10 and 74.24, stipulates that proprietary lime-sulfur solutions should maintain a working solution to provide 2.0% sulfide sulfur for cattle and 1.5% sulfide sulfur for sheep. It is the responsibility of the manufacturer's label to recommend accurate directions for the dilution of his standard lime-sulfur concentrate. These recommendations should be based on actual chemical evaluations of the diluted concentrate for sulfide sulfur, as given below.

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1. The term "permitted" refers to those compounds that meet the standards of the Animal Disease Eradication Division for the particular use required. Only "permitted" compounds can be used in official work of the Animal Disease Eradication Division. It should be noted that though a product may be approved by the United States Department of Agriculture, this does not necessarily imply it is "permitted" in Animal Disease Eradication programs.

### 2.3 Test for sulfide sulfur

#### Reagents:

- 1) 0.3250 N Iodine solution - Dissolve 44 grams of iodine (U.S.P. XIV, resublimed crystals) and 88 grams of potassium iodide (U.S.P.) in water<sub>2</sub> and bring to 1 liter. Standardize against arsenious oxide.
- 2) Indicator solution - Mix 2 grams of sodium nitroferricyanide (Sodium nitroprusside, powdered, A.C.S.) intimately with 10 grams of sodium carbonate (U.S.P., monohydrated, powdered). Dissolve approximately 0.3 grams of this mixture in 15 ml of water in a dropping bottle. Since this solution is unstable, it is recommended that only 15 ml be made up at a time and that it be protected from light in a brown bottle.

#### Procedure:

- 1) Accurately pipette 50.00 ml of lime-sulfur solution which has been diluted to obtain 2.000% sulfide sulfur for cattle or 1.500% sulfide sulfur for sheep into a 300 ml erlenmeyer flask.
- 2) Using an accurate 50.00 ml burette, add iodine solution to the diluted lime-sulfur in the erlenmeyer, while swirling, until the yellow color of the latter becomes faint. Let the contents of the flask come to rest and gently drop on the surface one drop on indicator solution. Note if a violet color appears where indicator mixed with diluted lime-sulfur. If color appears, add a little more iodine from burette, mix, and test again with indicator. Continue in this way until the indicator fails to produce color. This is the end-point; avoid adding excess iodine.
- 3) Repeat until reproducible results are obtained.
- 4) Each ml of 0.3250 N iodine used for titration is equal to 0.1000% sulfide sulfur.

2.4 Application for Permitted Insecticide - Both manufacturer and distributor are required to certify that their formulation will be kept uniform with specifications. Forms ADE 10-12 and 10-13 for this purpose are obtainable from Director, Animal Disease Eradication Division, Agricultural Research Service, United States Department of Agriculture, Federal Center Building, Hyattsville, Maryland 20781.

2.4.1 In addition, the manufacturer must submit a representative sample (16 oz) and a printed label for examination.

2.4.2 Deviation from specifications and any change in brand name will invalidate the permission granted under application.

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2. cf., "Methods of Analysis of the Association of Official Agricultural Chemists", 9th edition, p. 696 (1960).

2.5 Labeling - The labeling shall be registered in accordance with the Federal Insecticide, Fungicide and Rodenticide Act under the jurisdiction of the Pesticides Regulation Division, Agricultural Research Service, Washington 25, D. C.

It is recommended that the manufacturer include a statement to the effect that State or Federal animal disease regulatory officials be consulted concerning the product's official use in animal disease regulatory programs. It would also be helpful if the label referred to both "scabies and mange" without listing the specific mites or if the names of mites are included the list should include Psoroptic, Chorioptic and Sarcoptic mites.

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